```
 1      /--------------------------------------------------------------------
 2      /
 3      /
 4      /
 5      /
 6      /
 7      / THIS PROGRAM SOURCE FILE IS SUPPLIED IN CONFIDENCE TO THE
 8      / CUSTOMER; THE CONTENTS OR DETAILS OF ITS OPERATION MAY ONLY
 9      / BE DISCLOSED TO PERSONS EMPLOYED BY THE CUSTOMER WHO
10      / REQUIRE A KNOWLEDGE OF THE SOFTWARE CODING TO CARRY OUT
11      / THEIR JOB. DISCLOSURE TO ANY OTHER PERSON MUST HAVE PRIOR
12      / AAUTHORISATION FROM THE DIRECTORS OF REDAC SOFTWARE LIMITED
13      /
14      /1       SUITE           :  P.C.B. LAYOUT
15      /2       PROGRAM TITLE   :  REDAL23 MARK2
16      /3       ROUTINE TITLE   :
17      /
18      /4       AUTHOR          :
19      /5       DATE            :
20      /
21      /6       PURPOSE         :
22      /
23      /
24      /7       CALLING SEQUENCE AND DESCIPTION OF ARGUMENTS :
25      /
26      /8       I/O DEVICES AND FUNCTIONS :
27      /
28      /9       REGISTERS USED :
29      /
30      /10      EXTERNAL COMMON AREAS :
31      /
32      /11      INTERNAL COMMON AREAS :
33      /
34      /12      EXTERNAL GLOBALS :
35      /
36      /13      INTERNAL GLOBALS :
37      /
38      /14      CONDITIONAL ASSEMBLY PARAMETERS :
39      /
40      /15      METHOD :
41      /
42      /16      AMENDMENTS :
43      /
44      / SUBROUTINE PTCOMP CHECKS IF ANY P.T. HOLES UNDER
45      / COMPONENTS. O/PS COORDS OF ANY SUCH HOLES.
46      / CONDITIONAL ASSEMBLY SLOT=4 FOR LP
```

```
47                                    .TITLE PTCOMP
48                                    .GLOBL PTCOMP,READRT,.DA,INTOP
49        00000 R 000000 A    LIBRY .CBD LIBRY 1
50        00001 R 000000 A    COMPS .CBD COMPS 1
51        00002 R 000000 A    ROUTAD .CBD ROUTE 1
52        00003 R 000000 A    EOLIB .CBD EOLBAD 1      EOLIB
53        00004 R 000000 A    EOCOMP .CBD EOCMAD 1     EOCOMP
54        00005 R 000000 A    EOROUT .CBD EORTAD 1     EOROUT
55        00006 R 740040 A    PTCOMP  XX
56        00007 R 220000 R         LAC*  LIBRY
57        00010 R 040517 R         DAC  LIBAD
58        00011 R 220001 R         LAC*  COMPS
59        00012 R 040516 R         DAC  COMPAD#
60        00013 R 120520 E         JMS*  INTOP  /INITIALISE O/P DEVICE
61        00014 R 600020 R         JMP  .+1+3
62        00015 R 000523 R         .DSA  (0
63        00016 R 000523 R         .DSA  (0
64        00017 R 000524 R         .DSA  (-1
65                            / PRINT PAGE TITLES
66                                  .WRITE  4,2,MESSA,34
          00020 R 002004 A *G         CAL+2*1000 4&777
          00021 R 000011 A *G         11
          00022 R 000500 R *G         MESSA
                        *G         .DEC
          00023 R 777736 A *G         -34
67                                  .WAIT 4
          00024 R 000004 A *G         CAL 4&777
          00025 R 000012 A *G         12
68                                  .WRITE  4,2,MESSB,34
          00026 R 002004 A *G         CAL+2*1000 4&777
          00027 R 000011 A *G         11
          00030 R 000464 R *G         MESSB
                        *G         .DEC
          00031 R 777736 A *G         -34
69                                  .WAIT 4
          00032 R 000004 A *G         CAL 4&777
          00033 R 000012 A *G         12
70        00034 R 220002 R         LAC* ROUTAD
71        00035 R 040441 R         DAC ADRT
72        00036 R 360005 R         TAD* EOROUT
73        00037 R 723777 A         AAC -1
74        00040 R 040442 R         DAC ENDRT / ABS PTR TO END OF ROUTES
75        00041 R 200441 R    RUTSCN LAC ADRT
76        00042 R 540442 R         SAD ENDRT
77        00043 R 620006 R         JMP* PTCOMP /FINISHED ALL ROUTES
78        00044 R 060525 R         DAC* (10
79        00045 R 220010 A         LAC* 10
80        00046 R 744000 A         CLL
81        00047 R 640512 A         LRS 12
82        00050 R 040443 R         DAC NWDS / NO OF WORDS IN ROUTE IN ROUTES ARRAY
83        00051 R 220002 R         LAC* ROUTAD
84        00052 R 740031 A         TCA
```

Handwritten annotations (right margin):

```
.XENON .CBD .XX 7

CLX
LAC (6
PAL
LUP  LAC* .XENON,X
DAC  COPPER,X
AXS 7
JMP LUP
```

```
 85        00053 R 340441 R     TAD ADRT
 86        00054 R 740030 A     IAC
 87        00055 R 040444 R     DAC RTPT
 88        00056 R 120521 E     JMS* READRT / READ NEXT ROUTE INTO BUFF
 89        00057 R 600063 R     JMP .+1+3
 90        00060 R 000274 R     .DSA BUFF
 91        00061 R 000526 R     .DSA (1 / NON DESTRUCTIVE READ
 92        00062 R 000444 R     .DSA RTPT
 93                             / NOW SCAN ROUTE IN BUFF
 94                             /
 95                             /
 96        00063 R 140445 R     DZM NPT / NO OF PTS SCANNED
 97        00064 R 200527 R     LAC (BUFF
 98        00065 R 040463 R     DAC BFAD / PTR TO POINT IN BUFF
 99        00066 R 200445 R     BUFSCN LAC NPT
100        00067 R 540274 R     SAD BUFF
101        00070 R 600120 R     JMP ENBUF / FINISHED THIS ROUTE IN BUFF
102        00071 R 723776 A     AAC -2
103        00072 R 741100 A     SPA
104        00073 R 600111 R     JMP NEXPT
105        00074 R 220463 R     LAC* BFAD / SIDE OF THIS SEG
106        00075 R 540446 R     SAD SIDE / LAST SEG
107        00076 R 600112 R     JMP NEXPT+1 / SAME SIDE,NO P.T. HOLE
108        00077 R 200463 R     LAC BFAD
109        00100 R 723776 A     AAC -2
110        00101 R 040463 R     DAC BFAD
111        00102 R 220463 R     LAC* BFAD
112        00103 R 040447 R     DAC XP
113        00104 R 440463 R     ISZ BFAD
114        00105 R 220463 R     LAC* BFAD
115        00106 R 040450 R     DAC YP
116        00107 R 100124 R     JMS COMPAR
117        00110 R 440463 R     ISZ BFAD
118        00111 R 220463 R     NEXPT LAC* BFAD
119        00112 R 040446 R     DAC SIDE / STORE SEG SIDE
120        00113 R 200463 R     LAC BFAD
121        00114 R 723003 A     AAC 3
122        00115 R 040463 R     DAC BFAD / UPDATE TO NEXT PT
123        00116 R 440445 R     ISZ NPT
124        00117 R 600066 R     JMP BUFSCN
125        00120 R 200441 R     ENBUF LAC ADRT
126        00121 R 340443 R     TAD NWDS
127        00122 R 040441 R     DAC ADRT / UPDATE PTR TO NXT ROUTE
128        00123 R 600041 R     JMP RUTSCN
129                             /
130                             / NOW SEE IF PT HOLE IS UNDER ANY COMP
131                             /
132                             /
133        00124 R 740040 A     COMPAR XX
134        00125 R 200516 R     LAC COMPAD
135        00126 R 040451 R     DAC ADCMP
136        00127 R 360004 R     TAD* EOCOMP
```

```
137        00130 R 723777 A        AAC -1
138        00131 R 040452 R        DAC ENCMP / ABS PTR TO END OF COMPS
139        00132 R 200451 R    CMPSCN LAC ADCMP
140        00133 R 540452 R        SAD ENCMP
141        00134 R 620124 R        JMP* COMPAR
142        00135 R 723003 A        AAC 3
143        00136 R 040451 R        DAC ADCMP
144        00137 R 220451 R        LAC* ADCMP
145        00140 R 500530 R        AND (777
146        00141 R 040453 R        DAC LIBPTR
147        00142 R 220451 R        LAC* ADCMP
148        00143 R 640520 A        LRS 20
149        00144 R 500531 R        AND (3
150        00145 R 040454 R        DAC ORNT / COMPONENT ORIENTATION
151        00146 R 440451 R        ISZ ADCMP
152        00147 R 220451 R        LAC* ADCMP
153        00150 R 500532 R        AND (1777
154        00151 R 040455 R        DAC XMIN
155        00152 R 040461 R        DAC XMAX / GET COMP POSN
156        00153 R 440451 R        ISZ ADCMP
157        00154 R 220451 R        LAC* ADCMP
158        00155 R 500532 R        AND (1777
159        00156 R 040456 R        DAC YMIN
160        00157 R 040462 R        DAC YMAX
161        00160 R 440451 R        ISZ ADCMP / UPDATE FOR NEXT COMP
162        00161 R 200517 R        LAC LIBAD#
163        00162 R 340453 R        TAD LIBPTR
164        00163 R 740030 A        IAC / PTR TO 3RD WRD IN LIB ENTRY
165        00164 R 040453 R        DAC LIBPTR / ABS PTR NOW
166        00165 R 220453 R        LAC* LIBPTR
167        00166 R 500530 R        AND (777
168        00167 R 040460 R        DAC YSIZ
169        00170 R 220453 R        LAC* LIBPTR
170        00171 R 744000 A        CLL
171        00172 R 640511 A        LRS 11
172        00173 R 040457 R        DAC XSIZ / X,Y SIZE OF COMP
173        00174 R 200454 R        LAC ORNT
174        00175 R 741200 A        SNA
175        00176 R 600227 R        JMP OR0
176        00177 R 540526 R        SAD (1
177        00200 R 600221 R        JMP OR1
178        00201 R 540533 R        SAD (2
179        00202 R 600210 R        JMP OR2
180        00203 R 200460 R    OR3 LAC YSIZ
181        00204 R 340461 R        TAD XMAX
182        00205 R 040461 R        DAC XMAX
183        00206 R 200457 R        LAC XSIZ
184        00207 R 600215 R        JMP NSTY
185        00210 R 200457 R    OR2 LAC XSIZ
186        00211 R 740031 A        TCA
187        00212 R 340455 R        TAD XMIN
188        00213 R 040455 R        DAC XMIN
```

```
189      00214 R 200460 R    LAC YSIZ
190      00215 R 740031 A   NSTY TCA
191      00216 R 340456 R    TAD YMIN
192      00217 R 040456 R    DAC YMIN
193      00220 R 600235 R    JMP EX
194      00221 R 200460 R   OR1 LAC YSIZ
195      00222 R 740031 A    TCA
196      00223 R 340455 R    TAD XMIN
197      00224 R 040455 R    DAC XMIN
198      00225 R 200457 R    LAC XSIZ
199      00226 R 600233 R    JMP STRY
200      00227 R 200457 R   OR0 LAC XSIZ
201      00230 R 340461 R    TAD XMAX
202      00231 R 040461 R    DAC XMAX
203      00232 R 200460 R    LAC YSIZ
204      00233 R 340462 R   STRY TAD YMAX
205      00234 R 040462 R    DAC YMAX
206                         / TEST HOLE POS AGAINTST COMP MAX,MIN
207                         /
208      00235 R 200447 R   EX LAC XP
209      00236 R 740031 A    TCA
210      00237 R 652000 A    LMQ
211      00240 R 340461 R    TAD XMAX
212      00241 R 741100 A    SPA
213      00242 R 600132 R    JMP CMPSCN / NOT UNDER THIS COMP
214      00243 R 641002 A    LACQ
215      00244 R 340455 R    TAD XMIN
216      00245 R 740300 A    SMA!SZA
217      00246 R 600132 R    JMP CMPSCN
218      00247 R 200450 R    LAC YP
219      00250 R 740031 A    TCA
220      00251 R 652000 A    LMQ
221      00252 R 340462 R    TAD YMAX
222      00253 R 741100 A    SPA
223      00254 R 600132 R    JMP CMPSCN
224      00255 R 641002 A    LACQ
225      00256 R 340456 R    TAD YMIN
226      00257 R 740300 A    SMA!SZA
227      00260 R 600132 R    JMP CMPSCN
228      00261 R 120520 E    JMS*   INTOP
229      00262 R 600266 R    JMP    .+1+3
230      00263 R 000447 R    .DSA   XP
231      00264 R 000534 R    .DSA   (12
232      00265 R 000526 R    .DSA   (1
233      00266 R 120520 E    JMS*   INTOP
234      00267 R 600273 R    JMP    .+1+3
235      00270 R 000450 R    .DSA   YP
236      00271 R 000534 R    .DSA   (12
237      00272 R 000523 R    .DSA   (0
238      00273 R 600132 R    JMP CMPSCN
239                         /
240                         /
```

```
241                                     / SYMBOL TABLE FOLLOWS
242                                     /
243     00274 R           A             BUFF .BLOCK 144
244     00440 R 000000 A               MODE 0
245     00441 R 000000 A               ADRT 0
246     00442 R 000000 A               ENDRT 0
247     00443 R 000000 A               NWDS 0
248     00444 R 000000 A               RTPT 0
249     00445 R 000000 A               NPT 0
250     00446 R 000000 A               SIDE 0
251     00447 R 000000 A               XP 0
252     00450 R 000000 A               YP 0
253     00451 R 000000 A               ADCMP 0
254     00452 R 000000 A               ENCMP 0
255     00453 R 000000 A               LIBPTR 0
256     00454 R 000000 A               ORNT 0
257     00455 R 000000 A               XMIN 0
258     00456 R 000000 A               YMIN 0
259     00457 R 000000 A               XSIZ 0
260     00460 R 000000 A               YSIZ 0
261     00461 R 000000 A               XMAX 0
262     00462 R 000000 A               YMAX 0
263     00463 R 000000 A               BFAD 0
264     00464 R 002002 A               MESSB 2002; 0
        00465 R 000000 A
265     00466 R 201004 A                 .ASCII /    XCOORD    YCOORD /<15>
        00467 R 020100 A
        00470 R 542071 A
        00471 R 747644 A
        00472 R 421004 A
        00473 R 020100 A
        00474 R 546071 A
        00475 R 747644 A
        00476 R 421001 A
        00477 R 500000 A
266     00500 R 002002 A               MESSA 2002; 0
        00501 R 000000 A
267     00502 R 501352 A                 .ASCII /P.T. HOLES UNDER COMPONENTS /<15>
        00503 R 427100 A
        00504 R 442371 A
        00505 R 442646 A
        00506 R 202531 A
        00507 R 642212 A
        00510 R 511010 A
        00511 R 347632 A
        00512 R 502371 A
        00513 R 642634 A
        00514 R 522464 A
        00515 R 006400 A
268             000000 A                 .END
        00520 R 000520 E *E
        00521 R 000521 E *E
```

COPPER BOARD LIBRY CONNX COMPS ROUTAB (handwritten annotation)

```
00522 R 000522 E *E
00523 R 000000 A *L
00524 R 777777 A *L
00525 R 000010 A *L
00526 R 000001 A *L
00527 R 000274 R *L
00530 R 000777 A *L
00531 R 000003 A *L
00532 R 001777 A *L
00533 R 000002 A *L
00534 R 000012 A *L
      SIZE=00535     NO ERROR LINES
```

```
ADCMP   00451   135    139    143    144    147    151    152    156
                157    161    253*
ADRT    00441    71     75     85    125    127    245*
BFAD    00463    98    105    108    110    111    113    114    117
                118    120    122    263*
BUFF    00274    90     97    100    243*
BUFSCN  00066    99*   124
CMPSCN  00132   139*   213    217    223    227    238
COMPAD  00516    59    134
COMPAR  00124   116    133*   141
COMPS   00001    50*    50     58
ENBUF   00120   101    125*
ENCMP   00452   138    140    254*
ENDRT   00442    74     76    246*
EOCOMP  00004    53*   136
EOLIB   00003    52*
EOROUT  00005    54*    72
EX      00235   193    208*
INTOP   00520    48     60    228    233
LIBAD   00517    57    162
LIBPTR  00453   146    163    165    166    169    255*
LIBRY   00000    49*    49     56
MESSA   00500    66    266*
MESSB   00464    68    264*
MODE    00440   244*
NEXPT   00111   104    107    118*
NPT     00445    96     99    123    249*
NSTY    00215   184    190*
NWDS    00443    82    126    247*
ORNT    00454   150    173    256*
OR0     00227   175    200*
OR1     00221   177    194*
OR2     00210   179    185*
OR3     00203   180*
PTCOMP  00006    47     48     55*    77
READRT  00521    48     88
ROUTAD  00002    51*    70     83
RTPT    00444    87     92    248*
RUTSCN  00041    75*   128
SIDE    00446   106    119    250*
SLOT    777775
STRY    00233   199    204*
XMAX    00461   155    181    182    201    202    211    261*
XMIN    00455   154    187    188    196    197    215    257*
XP      00447   112    208    230    251*
XSIZ    00457   172    183    185    198    200    259*
YMAX    00462   160    204    205    221    262*
YMIN    00456   159    191    192    225    258*
YP      00450   115    218    235    252*
YSIZ    00460   168    180    189    194    203    260*
.DA     00522    48
```